

REMARKS/ARGUMENTS

Upon entry of the above amendment, Claims 1, 3, 6-24, 26-28, 37-40, 42, and 47-63 remain in this application. Claims 2, 4, 5, 25, 29-36, 41 and 43-46 have been canceled (of these, claim 25 has been canceled upon entry of this particular amendment). Claim 60 is amended. Claims 61-63 are new claims.

The Requested Amendment

Claim 60 has been amended to remove a minor punctuation mistake. New claim 61 is supported at page 13, lines 3-5 and page 33, lines 7-9. Claim 25 is rewritten in independent form as new claim 62. New claim 63 is based on claim 1 of record and the hydroxy-substituted dithiocarbamates described in Examples 9, 11, 12, and 13 of the instant specification.

No new matter has been introduced. Therefore, it is respectfully submitted that entry of the amendment at this time is appropriate.

Response to Objection

The Office Action is understood to take the position that if claim 59 is found allowable, then claim 60 will be objected to under 37 CFR 1.75 as being a "substantial duplicate" thereof.

Applicant traverses that position. Claim 59 recites a list of epoxides which are various alkyl glycidyl thioethers, while claim 60 recites a list of epoxides as various alkyl glycidyl ethers. The alkyl glycidyl ethers recited in claim 60 have broader coverage than those of claim 59 in that the ethers recited in claim 60 read on thioethers and non-thioethers. The instant specification provides enabling disclosures for both classes of epoxides (e.g., see page 8, line 2 through page 9, line 4; Example 1; and Example 9).

Therefore, the recitations of claim 60 are not a "substantial duplicate" of those of claim 59, and, accordingly, this objection is inapplicable.

Response to Obviousness Rejections

I. Claims 1, 3, 6-28, 37-40, 42, 47-60 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,174,842 to Gatto et al. combined with Latyuk et al. and Belov et al. This is a new grounds of rejection. Applicant respectfully traverses for at least the following reasons.

Independent claims 1, 56, 62, and 63 specifically recite a combination of a molybdenum source, a hydroxy-substituted dithiocarbamate having a thioether or ether epoxide moiety as indicated, and optionally or affirmatively, a phosphorous source. Claims 1 and 62 specify that the combination is present in the context of an *oil-based* composition. Claims 26, 27 and 37 recite *lubricating oil* with a minor amount of the composition of claim 1; and claim 55 recites *crankcase oil* comprising the composition of claim 20.

The most recent Office Action is understood to take the position that Gatto et al. teach lubricating oil compositions comprising certain range amounts of at least one oil-soluble molybdenum compound substantially free of reactive sulfur, at least one oil-soluble diarylamine, and at least one alkaline-earth metal phenate detergent (p. 2). According to the Office Action, the oil described by Gatto et al. may contain a detergent/inhibitor additive package which may include a phosphorous source like ZDDP. As acknowledged in the most recent Office Action, Gatto et al. differ from the instant claims by failing to disclose the use of hydroxy-substituted dithiocarbamates as an oil additive. However, the Office Action is understood to refer to the secondary references of Latyuk et al. and Belov et al. as purportedly teaching hydroxy-substituted dithiocarbamates having good antiwear, antiscuff and anticorrosion properties as additives for lubricating oil compositions (p. 3). The Office Action is understood to conclude that it would have been obvious to add a hydroxy-substituted dithiocarbamate as taught by Latyuk et al. and Belov et al. to a lubricating composition of Gatto et al. to improve those properties thereof (p. 3).

Applicant point outs that Gatto et al. do not suggest the two-component combination of a molybdenum source *per se* with a hydroxyalkyl-dithiocarbamate for any purpose in a lubricating

or oil composition. As explained in the instant specification, one of the discoveries of the present invention is that phosphorus levels in engine oil compositions can be reduced or even eliminated by use of claimed two-component combination in an engine lubricating oil composition, which helps to reduce contamination of catalyst in catalytic converters to thereby improve their durability, while maintaining satisfactory engine antiwear and antioxidation control at the reduced phosphorous level conditions. Gatto et al. mentions this problem, but attacks the problem using a fundamentally different additive combination as compared to the present invention (e.g., col. 10, lines 25-28).

Neither Latyuk et al. nor Belov et al. indicate the compatibility of, nor that any unexpected results might be obtained by, combining a hydroxy-substituted dithiocarbamate with a lubricant per Gatto et al. containing an oil-soluble molybdenum compound (which Gatto et al. uses in further combination with at least one oil-soluble diarylamine, and at least one alkaline-earth metal phenate detergent). In particular, neither Latyuk et al. or Belov et al. teach or suggest that phosphorus levels in Gatto et al.'s lubricant may be reduced or even eliminated by addition of hydroxy-substituted dithiocarbamate thereto, much less help to reduce contamination of catalyst in catalytic converters to thereby improve their durability, while maintaining satisfactory engine antiwear and antioxidation control at reduced phosphorous levels.

Even assuming a prima facie case of obviousness had been established against the present claims based on a combination of Gatto et al. with Ltyuk et al or Belov et al., for sake of argument only, Applicant has submitted objective evidence of the nonobviousness of the presently claimed invention.

"Prima facie obviousness is a legal conclusion, not a fact. Facts established by rebuttal evidence must be evaluated along with facts on which the earlier conclusion was reached, and not against the conclusion itself." *In re Piasecki*, 745 F.2d 1468, 223 USPQ 785, 788 (Fed. Cir. 1984)(quoting *In re Rinehart*, 513 F.2d 1049, 1052, 189 USPQ 143, 147 (CCPA 1976).

Comparative data has been presented in the instant specification that illustrate the unexpected benefits of the claimed invention. Applicant submits that these objective wear and oxidation stability data described in the instant specification are adequate to rebut any prima facie case of obviousness made against the present claims in the most recent Office Action. This comparative data must be weighed along with the prior art in determining obviousness. *In re*

Margolis, 785 F.2d 1029, 22 USPQ 940 (Fed. Cir. 1986). The comparative data presented in the instant specification was not commented upon in the most recent Office Action, although new grounds of rejection have been interposed.

Referring to Table 1 at pages 31-32 of the instant specification, the wear control data presented shows that combining a molybdenum compound and a separate hydroxy-substituted dithiocarbamate in oil samples containing reduced levels of phosphorus (500 ppm instead of standard 1000 ppm) yielded significantly reduced wear (as measured in terms of Four-Ball Wear Scar) as compared to comparison oil samples that used twice the level of hydroxy-substituted dithiocarbamate but without any molybdenum compound (e.g., see inventive oil sample 10 vs. comparison sample 5; inventive oil sample 19 vs. comparison sample 14; inventive oil sample 28 vs. comparison sample 23; inventive oil sample 37 vs. comparison sample 32).

Similarly, referring to Table 2 at pages 36-37 of the instant specification, the oxidation stability data presented shows that combining a molybdenum compound and an hydroxy-substituted dithiocarbamate in oil samples containing reduced levels of phosphorus (500 ppm again) yielded significantly improved oxidative stability (as measured in terms of PDSC Onset Temp.) as compared to comparison oil samples that used twice the level of hydroxy-substituted dithiocarbamate but without any molybdenum compound (e.g., see inventive oil sample 10 vs. comparison sample 5; inventive oil sample 19 vs. comparison sample 14; inventive oil sample 28 vs. comparison sample 23; inventive oil sample 37 vs. comparison sample 32).

Also, comparison samples were tested and reported in the instant specification that included a sulfur-free organo-molybdenum compound (viz., Molyvan® 855) but did not include hydroxy-dithiocarbamate (e.g., Table 1, sample 3; Table 2, sample 3). The Four-Ball Wear Scar value measured for comparison sample 3 (i.e., 0.58 mm) was significantly higher in value than the values measured for inventive samples 10-12, 19-21, 28-29, 38, 39 (i.e., 0.32-0.51 mm), which combined hydroxy-dithiocarbamate and a sulfur-free organo-molybdenum compound.

Referring to Table 2 in the instant specification, the PDSC onset temperature for sample 3 (i.e., 211.7°C) was lower, and thus demonstrated lower oxidative stability, than inventive oil samples containing an equal amount of phosphorus (i.e. 500 PPM P), which include Oil Sample 10 (215.2°C), Sample 11 (217.5°C), Sample 12 (219.2°C) as well as Samples 19-21, 28-30, and 37-39.

These objective wear and oxidation stability data showing unexpected results, as described in the instant specification, specifically rebut the contention made in the Office Action that it would have been prima facie obvious to combine hydroxy-substituted dithiocarbamate and a molybdenum compound in a lubricant or oil-based composition.

These comparative data presented in the instant specification also are both commensurate with the claimed scope of the invention and reasonably compare with the closest art. *In re Payne*, 606 F.2d 303, 316, 203 USPQ 245, 256 (CCPA 1979) (an applicant need not test compounds taught in every reference. "However, where an applicant tests less than all cited compounds, the test must be sufficient to permit a conclusion respecting the relative effectiveness of applicant's compounds and the compounds of the closest prior art.")

Applicant has provided comparative data in the specification that is reasonably representative of the claimed combination of materials, and includes data that is reasonably representative of the closest prior art. For instance, Example 1 of Gatto et al. describes an oil containing Molyvan® 855 as the molybdenum compound. Molyvan® 855 was the molybdenum compound used in instant Examples 14-15, including comparison samples that did not include hydroxy-dithiocarbamate (e.g., Table 1, sample 3; Table 2, sample 3).

Example I of Luciani et al. (col. 27), cited in a separate new rejection advanced in the most recent Office Action (and discussed below in more detail), describes a lubricant prepared by incorporating 3% by weight of the product of Example 1, which generally is a hydroxyalkyl dithiocarbamate, into a SAE 10W-40 lubricating oil. Examples 14 and 15 of the instant specification include tested oil samples with hydroxydithiocarbamates used alone, or in combination with a molybdenum compound, in SAE Grade 5W-30 type motor oil.

Applicant submits that the comparison samples described in instant Examples 14 and 15 of the instant specification are representative of the closest prior art in all important respects.

In view of the above, Applicant submits that this rejection is untenable, and it should be withdrawn.

II. Claims 1, 3, 6-28, 37-40, 42, 47-60 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 5,698,498 to Luciani et al. combined with Latyuk et al., Belov et al., and the "admitted prior art." This is a new grounds of rejection. Applicant respectfully traverses for at least the following reasons.

The most recent Office Action is understood to take the position that Luciani et al. teach lubricating oil compositions comprising a hydroxyalkyl dithiocarbamate or a borate thereof and at least one sulfur compound or at least one phosphorus or boron antiwear or extreme pressure agent (pp. 3-4). According to the most recent Office Action, Luciani et al. differs from the instant claim in not teaching alkylthiohydroxydithiocarbamates and compositions comprising molybdenum compounds (p. 4). However, the Office Action is understood to refer to the secondary references of Latyuk et al. and Belov et al. as purportedly teaching hydroxy-substituted dithiocarbamates having good antiwear, antiscuff and anticorrosion properties as additives for lubricating oil compositions (p. 5).

The most recent Office Action also indicates that Applicant has acknowledged that molybdenum compounds are exemplified in prior patents as antioxidants, deposit control additives, antiwear additives and friction modifiers (citing page 2, lines 9-32). The Office Action is understood to conclude that it would have been obvious to use a hydroxy-substituted dithiocarbamate as taught by Latyuk et al. and Belov et al. to a lubricating composition of Luciani et al. to improve the antiwear, antiscuff and anticorrosion properties thereof, and further that it would have been obvious to include a molybdenum compound in order to improve the antioxidant, deposit control, antiwear and friction modifying properties of the Luciani et al. lubricating composition in view of the teachings at page 2 of the specification of the instant specification (pp. 5-6).

As indicated in the most recent Office Action and record, the Luciani et al. reference only describes hydroxyalkyl dithiocarbamates made with an "... epoxide [that] is generally an aliphatic epoxide having at least 2 to about 30 carbon atoms" (col. 6, lines 41-43, Applicant's emphasis added by underlining).

The instant independent claims recite a hydroxy-substituted dithiocarbamate component or structure having a structural moiety (R") that has a heteroatom(s), viz. a sulfur or oxygen atom, in the main chain of the moiety. That is, structural moiety (R") is derived from thioether-epoxide chemistries (e.g., see claims 1, 56, 62, 63) and/or ether-epoxide chemistries (e.g., see claims 1, 38-40, 42, 47-49, 56). These R" moieties are not "aliphatic" epoxides nor moieties derived therefrom, as they structurally contain at least one heteroatom in addition to carbon and hydrogen atoms.

Neither Latyuk et al. or Belov et al. teach or suggest that phosphorus levels in Luciani et al.'s lubricant may be reduced or even eliminated by substituting a hydroxy-substituted dithiocarbamate derived with thioether-epoxide or ether-epoxide chemistries for the aliphatic epoxide chemistry used in the hydroxyalkyl dithiocarbamates of Luciani et al., much less help to reduce contamination of catalyst in catalytic converters to thereby improve their durability, while maintaining satisfactory engine antiwear and antioxidation control at reduced phosphorous levels.

The reliance in the most recent Office Action on the alleged "admissions" at page 2, lines 9-32, of the instant specification is unavailing. The teachings at page 2 of the specification do not explicitly and unequivocally admit that molybdenum compounds have been used in the past in combination with a hydroxyalkyl dithiocarbamate in a lubricating composition. There is no suggestion made in the instant specification at page 2 of such a combination, nor why such a combination may be desirable. In particular, the discussions at page 2 of the instant specification do not mention or suggest combining a molybdenum source with a hydroxy-substituted dithiocarbamate derived from thioether-epoxide or ether-epoxide chemistries as presently claimed, much less the unexpected results achieved therefrom.

Even assuming a prima facie case of obviousness had been established against the present claims based on a combination of Luciani et al. with Ltyuk et al., Belov et al., and the disclosure at page 2 of the specification, for sake of argument only, Applicant has submitted objective evidence of the nonobviousness of the presently claimed invention. Reference is made to the foregoing discussion of the objective evidence of nonobviousness set forth in the examples of the instant specification.

Again, the objective data in the specification shows, among other things, that the molybdenum compound/hydroxy-substituted dithiocarbamate combinations in lubricating compositions significantly outperformed any results obtained from merely using the hydroxy-substituted dithiocarbamate alone or molybdenum alone therein. The significantly improved results achieved by the combination would not have been within the expectations of one of ordinary skill in the art.

In view of the above, Applicant submits that this rejection is untenable, and it should be withdrawn.

Response to Provisional Obviousness-Double Patenting Rejection

Claims 1, 3, 6-28, 37-40, 42, and 47-60 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-61 of co-pending application serial no. 10/062,161.

As indicated in the most recent Office Action, this is only a provisional rejection because the conflicting claims have not in fact been patented.

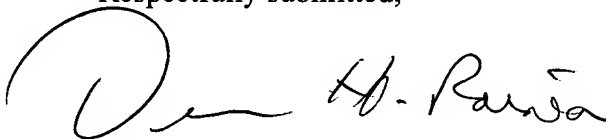
Upon issuance of any U.S. patent on the above-identified co-pending application, Applicant will submit a terminal disclaimer in compliance with 37 CFR 1.321(c) in the instant application if this rejection is still applicable at that time (M.P.E.P. §804(I)(B)).

Regarding the objection made against claim 25, under 37 CFR 1.75(c) in the most recent Office Action (p. 6), the foregoing amendment has obviated this objection. That is, claim 25 has been resubmitted as part of an independent claim (see claim 62).

In view of the foregoing, Applicant requests entry of the amendment, and reconsideration and withdrawal of the rejection. Applicant requests that a timely Notice of Allowance be issued in this case.

If the Examiner believes that a teleconference would be useful in expediting the prosecution of this application, the official is kindly invited to contact Applicant's undersigned representative of record.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Dennis H. Rainear", is written over a large, stylized circular flourish.

Dennis H. Rainear, Reg. No. 32,486

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